

Subject : _____

Date: _____

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1 الف) $\lim_{n \rightarrow r^+} f(n) - r = f \times r - r = \omega$ (1)

3 ب) $\lim_{n \rightarrow r^-} f(n) - r = f \times r - r = \omega$ (5)

5 الف) $\lim_{n \rightarrow r^+} f[n] - r = f \times [r^+] - r = f \times r - r = \omega$ (2)

7 ب) $\lim_{n \rightarrow r^-} f[n] - r = f \times [r^-] - r = f \times r - r = \omega$ (5)

9 الف) $\lim_{n \rightarrow r^+} [f(n) - r] = [f \times r^+ - r] = [\omega^+] = \omega$ (3)

11 ب) $\lim_{n \rightarrow r^-} [f(n) - r] = [f \times r^- - r] = [\omega^-] = \omega$ (5)

13 الف) $[\lim_{n \rightarrow r^+} f(n) - r] = [\omega] = \omega$ (4)

15 ب) $[\lim_{n \rightarrow r^-} f(n) - r] = [\omega] = \omega$ (5)

17 الف) $\lim_{n \rightarrow r} \frac{f(n) - r}{n - r} \xrightarrow{r^+} \frac{9}{0^+} = +\infty$
 $\xrightarrow{r^-} \frac{9}{0^-} = -\infty$ (5)

20 ب) $\lim_{n \rightarrow r} \frac{f(n) - r}{(n - r)^2} = \frac{9}{0^+} = +\infty$

الف) $\lim_{n \rightarrow 2} \frac{2n-2}{\sqrt{n-2}}$ $\xrightarrow{2^-}$ $\frac{0}{0}$ (5)

$\swarrow 2^+$ $\frac{4}{0^+} = +\infty$ (5)

ب) $\lim_{n \rightarrow 2} \frac{2n-2}{\sqrt{n^2-5n+2}}$ $\xrightarrow{2^-}$ $\frac{0}{0}$ $\frac{1}{+0} - \frac{2}{+0}$

$\swarrow 2^+$ $\frac{4}{0^+} = +\infty$

الف) $\lim_{n \rightarrow 2} \frac{2n-2}{n^2-\sqrt{n+1}}$ $\xrightarrow{2^+}$ $\frac{2}{0^-} = -\infty$ (V)

$\swarrow 2^-$ $\frac{2}{0^+} = +\infty$ $\frac{2}{+0} - \frac{2}{+0}$

ب) $\lim_{n \rightarrow 2} \frac{2n-2}{[n-2]}$ $\xrightarrow{2^+}$ $\frac{2}{[0^+]} = \frac{2}{0} \rightarrow \frac{0}{0}$ (5)

$\swarrow 2^-$ $\frac{2}{[0^-]} = \frac{2}{-1} = -2$

الف) $\lim_{n \rightarrow 2} [2n] + [-2n]$ $\xrightarrow{2^+}$ $[4^+] + [-4^-] = 0$ (A)

$\swarrow 2^-$ $[4^-] + [-4^+] = 0$ (5)

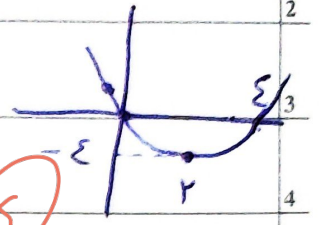
ب) $\lim_{n \rightarrow -4} [-2n] + [2n]$ $\xrightarrow{-4^+}$ $2(4) + (-8) = 0$

$\swarrow -4^-$ $2(4) + (-8) = 0$

الف) $\lim_{n \rightarrow r} [n^2 - \epsilon n] \xrightarrow{r^+} -\epsilon$ $-\frac{b}{2a} = r$ (9)

\downarrow

$r^- \rightarrow -\epsilon$

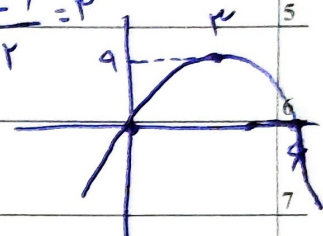


ب) $\lim_{n \rightarrow r} [\epsilon n - n^2] \xrightarrow{r^+} 1$

\downarrow

$r^- \rightarrow 1$

$-\frac{b}{2a} = \frac{-\epsilon}{-2} = r$



الف) $\lim_{n \rightarrow r} \frac{(n-r)}{n^2 - rn + r} \xrightarrow{r^+} \frac{(n-r)}{(n-r)(n-1)} = \frac{1}{(r-1)} = 1$ (10)

\downarrow

$r^- \rightarrow \frac{-1}{1} = -1$

ب) $\lim_{n \rightarrow 1} \frac{n - [n]}{n^2 - 1} \xrightarrow{1^+} \frac{n-1}{(n-1)(n+1)} = \frac{1}{r}$ (5)

\downarrow

$1^- \rightarrow \frac{1}{0} = -\infty$

$\frac{n}{n^2 - 1} \rightarrow \frac{1}{0} = -\infty$

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